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UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Group: Attorney Docket # 1788

Applicant(s) : BOECKING, F.

Serial No. :

Filed :

For : PIEZOELECTRIC ACTUATOR

INFORMATION DISCLOSURE STATEMENT

December 19, 2001

Honorable Commissioner of Patents
and Trademarks
Washington, D.C. 20231

S I R S:

____ In accordance with the Duty of Disclosure, Applicant(s) submit(s) herewith a copy of a Foreign Search Report in a counterpart application and copies of the reference(s) indicated therein.

____ In the event that the Foreign Search Report is in a foreign language, a translation thereof is herewith submitted.

__X__ Attached hereto is a FORM PTO 1449 listing the references.

____ Attached hereto is a copy of a reference cited in the specification of the application as filed. The specification itself recites the relevance of these documents.

_____Applicant petitions for consideration of this Information Disclosure Statement since it is being submitted after receipt of an office action and submits herewith the required fee. If this fee is missing or insufficient, then authorization is given to debit the account of the undersigned: 19-4675.

____ Attached hereto are copies of references cited which may be pertinent to this application. Since the references are in the English language, no statement of relevance is submitted.

____ Attached hereto is a copy of the Office Action issued in the corresponding German application, together with a translation thereof and copies of the references cited therein. A list of the cited references is also attached.

____ Attached hereto copies of references cited which may be pertinent to this application. An English translation of the references is also attached.

__X__ Attached hereto is a Statement of Relevancy and copies of references cited therein.

__X__ These references were sent to the USPTO by WIPO and are in the file of this application.

Respectfully submitted,

Michael J. Striker
Attorney for Applicant(s)
Reg. No. 27233

Acknowledgements of the publications cited in the parallel German examination procedure within the scope of duty of disclosure:

A piezoelectric actuator in the form of a monolithic multilayer acutator is made known in **EP 0 844 678 A1**. This piezoelectric actuator is composed of a multilayer structure of piezoelectric plies and internal electrodes arranged between them. The latter are integrated in the ply structure in the manner of a comb and are contacted in alternate directions with external electrodes in the direction of the ply structure, which external electrodes are arranged laterally on the piezoelectric actuator. In order to prevent voltage spark-overs that could lead to a destruction of the piezoelectric actuator, the internal electrodes are not extended completely to the opposite side of the piezoelectric actuator. As a result, a neutral phase without internal electrodes occurs in a region between two piezoelectric plies that has an internal electrode contacted on the opposite side in each case.

When the piezoelectric actuator is actuated, i.e., when an electrical voltage is applied to the external electrodes, a mechanical reaction occurs due to the generally known piezoelectric effect. This depends on the crystal structure of the piezoelectric plies and the application regions of the electrical voltage, and represents a push or pull in a specifiable direction. Mechanical stresses can thereby occur in the ply structure of the piezoelectric actuator which can trigger undesired crack formations, particularly in the region of the neutral phase.

Moreover, a further design of a multilayer actuator is disclosed in **JP 63-80 585 A**. In this multilayer actuator, a plurality of layers composed of ceramic material is stacked and comprises continuous internal electrodes between each of them. These are contacted in alternating fashion with external electrodes facing each other. The latter are composed of two layers, a conductive glass layer and a nickel layer applied to it in currentless fashion. The adhesion of the nickel layer is improved considerably with aid from the glass layer. Insulation means are

provided on one end of the internal electrodes to insulate the internal electrode against the external electrode not to be contacted. As a disadvantage, the formation of the insulation means on the multilayer actuator is relatively costly and makes its manufacture more expensive. In contrast to the subject of the invention, all internal electrodes are designed to be continuous, so that this multilayer actuator does not have a neutral phase.

October 30, 2001

DECLARATION

The undersigned, Dana Scruggs, having an office at 7970 Sunset Cove Drive, Indianapolis, Indiana 46236, hereby states that she is well acquainted with both the English and German languages and that the attached is a true translation to the best of her knowledge and ability of the PCT/DE 00/01629 of BOECKING, F., entitled "Piezoelectric Actuator".

The undersigned further declares that the above statement is true; and further, that this statement was made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or document or any patent resulting therefrom.

Dana Scruggs